

Julian Aleksandrowicz (1908–1988)

Julian Aleksandrowicz was born on the 20th of January 1908 in Cracow, to Józef (a merchant) and Zofia. After completing the 6th T. Kościuszko Secondary School in 1926 he started his degree at the Medical Faculty of the Jagiellonian University, gaining a doctor's diploma in 1933. A year later he also finished the Jagiellonian University's PE Institute. In 1934 he defended his Ph.D., the topic of which concerned the bioptic testing of marrow, research he had begun while still a medical student.

From 1933 to 1939 he worked as an assistant at the St. Lazarus Hospital in Cracow on the 1st Ward run by Prof. Tadeusz Tempka. At this time he was scientifically involved in experiments on the properties of heparin reducing blood coagulation as well as the possibilities for its storage.

Already in 1935, that is at the age of 27, he had published the article *O pośrednim przetaczaniu krwi konserwowanej* [On the indirect transfusion of preserved blood] in *Polska Gazeta Lekarska* and, two years later, he patented an apparatus for blood transfusion of his own design when only 29 (patent no. 27 514, Rzeczpospolita Polska 1937), the functioning of which he described in detail in 1937 in the medical journal *Lekarz Wojskowy* (the title of the work being: *Krew konserwowana i jej zastosowanie do przetaczania w wojskowej służbie zdrowia* [Preserved blood and its application in transfusions in the military health service]).

Several months before the outbreak of World War II he published the work *Przetaczanie krwi w czasie wojny* [Blood transfusion in wartime] dated 25 VI 1939 in the weekly *Gazeta Lekarska*, in which he wrote among other things:

The experiences of the wars fought in recent years have shown how incredibly important and often irreplaceable as a procedure in saving someone's life is a blood transfusion performed at the right time.

It is understood that during military operations we have a large number of casualties who require the fastest possible transfusion of blood as a result of the various indications such as severe anaemia after haemorrhages and the complications connected with it, the necessity for at least a momentary stopping of the haemorrhage, various forms of poisoning by military chemical substances, carbon monoxide, aniline dyes, states of post-stroke and toxic shock, septic states, infections, pre-operational states for those whose strength has deteriorated, various burns and scolds. A transfusion sufficiently quickly carried out, improves the suitability for the wounded to be evacuated – often troublesome, which is of immense importance particularly when we take into consideration the fact that a large number of fatalities are suffered amongst those who were not able to hold on and cope with the problems of transportation.

Blood transfusions have been hitherto applied in more distantly located and stationary medical units. Yet the proximity of the frontline means that the procedure comes into contact with huge difficulties, the presence of several persons is required for the procedure, such as the donor, a doctor, assistants etc., and above all the technical difficulties of the procedure itself, requiring a fair amount of skill, which are enhanced by the emotional state of the medical personnel.

In the face of the unavoidability of World War II this young doctor, a graduate of the Jagiellonian University's Medical Faculty, showed not only knowledge, inventiveness and ingenuity as well as appropriate scientific technique (writing at that time scientific articles which cited a dozen or so items from the international literature on the subject) but also a high degree of responsibility and care for the lot of the Polish soldier, defending on the battlefield the threatened Fatherland.

Drafted in August 1939 as a sub-lieutenant doctor, he was assigned to the 72nd Foot Regiment and was to take an active part in the fighting. After his escape from a prisoner-of-war camp he returned to Cracow in January 1940. Already in 1941 he found himself in the Cracow ghetto, where he organised one of the four hospitals that existed within its territory, attempting to help – as far as possible – as many patients as possible (The Hospital for Convalescents and the Chronically Ill at 10 Józefińska Street).

He was able to save the lives of many people, jeopardising his life in the process, before the eradication of the ghetto and the closure of the hospital on Józefińska Street, including the nurse Rega Jurowicz, who he covered with his coat to subsequently report that the hospital was now deserted.

Julian Aleksandrowicz himself, together with his wife and son, managed on the day the ghetto was eradicated to reach the Aryan side by means of

the sewage canals, after which they hid for a year in Cracow and environs (through the help of former patients, work colleagues and the underground connected with the Polish Socialist Party and the Home Army).

In the spring of 1944 he was transferred to the Home Army units in the Radom–Kielce area. In the famous *Jodła* Corps he organised the sanitary service, taking an active part in skirmishes as platoon commander. In recognition of these services he was later to be awarded the *Virtuti Militari* Cross, the Cross of Valour, the Cross of Merit with Swords and other military honours.

His heroism in those days is recalled by Krzysztof Hoffman MD (pseud. ‘Cyprian’ – a major in the 72nd Home Army Foot Regiment):

I got to know Professor Aleksandrowicz as lieutenant ‘Twardy’ [Hard/Tough] – our regimental doctor. I did not know either his surname or even more so anything about his pre-war scientific achievements. I was to notice him only during the first piece of combat near Radom – this was the autumn of 1944. The hamlet in which his unit was based was attacked by sizeable German forces. When the artillery shells caused a fire it turned out that there were wounded men in several of the burning huts. Then ‘Twardy’, together with several stretcher bearers, moved into the rescue. Twice – I remember – his uniform caught fire, he returned, rolled on the ground in order to extinguish it and again ran back to pull out those that were left. For this and other instances of bravery the regimental commander awarded him the *Virtuti Militari* Cross, which he was presented with after the war.

When the war ended J. Aleksandrowicz organised a health centre for those returning from camps. At the same time he took up work as an assistance at the Internal Illnesses’ Clinic, still run by Prof. T. Tempka.

While living in the ghetto (1941–1943) he wrote a scientific monograph on haematology and in escaping the ghetto he took the manuscript with him. He buried it, taking up a partisan war with the Germans. The manuscript was found after the war and became the basis for a book published in 1946. This beautifully published edition of 263 pages, 12 colour prints and 45 microphotographs was to become the first post-war textbook on haematology.

In 1947 he obtained his post-doctoral degree at the Medical Faculty of the Jagiellonian University on the basis of a work written while in the underground entitled *Schorzenia narządów krwiotwórczych w świetle badań biopptycznych* [Diseases of the blood producing organs in the light of bioptic research].

In 1949, on the initiative of professors Tempka, Jakubowski and Aleksandrowicz, the Polish Haematology Society was launched. This was to be the sixth European society after the French – 1931, Italian – 1933, German – 1937, Russian – 1937 and Swiss – 1946. Only in 1958 was there to be an American society, with the British and Hungarian ones being created only in 1960.

In Cracow in May 1950 the 1st Polish Haematologist Congress took place, at which 70 papers were given. The published congress proceedings ran to over 400 pages.

In 1950 assistant professor Aleksandrowicz was entrusted to organise the 3rd Clinic of Internal Diseases, later transformed into the Haematology Clinic. He was to direct these units for 28 years, and then through the next 10 – already as a retired professor – he was to remain in close contact with the Clinic of Haematology at the Medical Academy's Institute of Internal Medicine.

The academic title of associate professor he obtained in 1951, becoming a full professor in 1956.

Professor Aleksandrowicz assembled around himself many talented pupils, creating one of the leading medical centres in the country. Several generations of internal disease specialists and haematologists were to graduate from his school, of whom over 40 were to gain a Ph.D., nine a post-doctoral degree, while five went on to become professors. Others became the heads of internal diseases wards.

As early as 1945 J. Aleksandrowicz had started research into the pharmacological activeness of nitrogen mustard, discovering the anti-inflammatory and anti-allergic properties of this compound, as well as its ability to stimulate the regeneration of nerve tissue.

These observations were later confirmed by clinical tests showing the high level of effectiveness of small dosages of nitrogranulogen for patients with multiple sclerosis, retrobulbar inflammation as well as atrophy of the optic nerve.

Professor Aleksandrowicz's haematology research concentrated on the morphology and functions of blood cells. Towards the end of the 1940s he formulated a neo-unitarian theory of haemopoiesis as well as the nosography of blood diseases resulting from it. The unitarian theory supposed the origin of blood cells from a single cell morphologically corresponding to a small lymph cell, and subsequently from marrow and lymphocyte hemohistioblasts. Based on the proposed classification of blood diseases, assuming the existence of hyperplasia syndromes and the atrophy of individual cell lines, he foresaw the existence of disease units, which he was to identify and describe in the subsequent years.

At the same time the ultra-structural testing of blood cells was to result in the publication in 1955 (jointly with Julian Blicharski and Antoni Feltynowski) by Państwowe Wydawnictwo Naukowe of the monograph *Mikroskopia elektronowa komórek krwi* [The electron microscopy of blood cells].

Professor Aleksandrowicz had already undertaken research into molecular biology in the 1950s, specifically on the metabolism of ribonucleic acid (RNA) in leukaemia. He claimed, among other things, the heightened level of RNA in patients with granulocyte leukaemia, which was later to be consid-

ered a pathognomonic phenomenon. Further research and tests resulted in the discovery of various types of RNA in correct and pathological leucocytes, as well as in the blood plasma and urine of healthy and sick individuals.

On the basis of the above observations Prof. Aleksandrowicz proposed the role of leucocytes accumulation in the pathogenesis of chronic cases of leukaemia, something which was later to be proven through cytokinetic tests conducted by numerous haematology centres. In researching the factors with a predisposition for the development of leukaemia, he drew attention to and described the anthropological, dactylological and psychological indicators characteristic for various types of leukaemia.

In 1957 J. Aleksandrowicz, together with his assistant J. Blicharski, completed the first clinical marrow transplant from a monozygotic donor to her 50-year-old sister ill with chronic myeloid leukaemia. The results of this pioneering life-saving operation were published in *Acta Haematologica Polonica* in 1959 as well as in French in *Le Sang* in 1960.

At the beginning of the 1960s Prof. Aleksandrowicz started his epidemiologic research connected with the uneven distribution in the incidence of leukaemia in Poland, as well as in other countries. This research also concentrated on the clusters of human and bovine leukaemia in various regions of Poland as well as in various districts of Cracow. In the search for environmental leucogenetic factors he drew attention to the frequent appearance of deuteromycetes (*anamorphic fungi*) such as *Aspergillus flavus* in the flats of patients with proliferative diseases. These fungi produce mycotoxins displaying – as it was later to turn out – strong oncogene properties. The professor's colleagues were subsequently to confirm high levels of antibodies against the antigens *Aspergillus flavus* in the blood serum of patients with cancers and leukaemia of various types.

Treating the human organism as a reflection of ecological reality, he drew attention to the possible influence of disturbances in environmental composition on the content of bioelements in living organisms, both animal and human. He emphasised that such deficiencies such as excess bioelements and their mutual relations could be directly linked to the incidence of certain diseases including cardiovascular ailments, metabolic diseases, chronic inflammatory illnesses, psychiatric disorders, as well as cancers. So, for example, a low level of magnesium is conducive to the development of sclerosis, and lymphoma and leukaemias in laboratory animals, while a zinc deficiency results in fertility disorders, underdevelopment of the thymic-lymphatic system with ensuing immunodeficiency. Magnesium deficiency increases equally the risk of industrial heavy metal poisoning, while a deficiency of lithium in the organism can result in mental disturbances. Prof. Aleksandrowicz and his team showed in many of their experiments the possibility of the neutralisation, through the

use of selenium, of the toxic properties of aflatoxins as well as countering the effects of exposure to radiation of the entire body (in the case of laboratory animals) through supplementary dosages of radioactive cobalt. These above observations resulted in research into the ionograms of water, soil, food, as well as of blood and hair in various populations and regions.

In his search for methods optimally monitoring the bioelemental system in an organism he developed, in conjunction with Prof. Dobrowolski, a method for the evaluation of the concentrations of bioelements in particular blood cells by means of an X-ray microprobe coupled to a scanning electronic microscope (patent no. 14 866).

Understanding the homeostatic role of the immune system as well as the higher order function of the thymus gland in its ontogenetic development, as equally in the control of haemopoiesis, he initiated together with Prof. Wit Rzepecki an attempt to transplant the human thymus gland to patients with bone marrow failure. And subsequently he was to obtain in cooperation with the *Polfa* Pharmaceutical Plant in Jelenia Góra an active pharmaceutical derived from calf thymuses, which he called *Thymic Factor X* (TFX) – patent no. 108 714, 1984. This pharmaceutical displayed properties typical for thymus hormones. TFX was subsequently tested in a dozen or so academic centres in Poland on over 1,000 patients with symptomatically different yet pathogenically similar illness syndromes. Restoring the disturbed or weakened immunologic mechanisms, he showed the therapeutic value, reduced the intensification of clinical symptoms, rectified or normalised the disturbed immunologic or serologic indicators.

Professor Aleksandrowicz was the author, co-author, or editor-in-chief of an array of medical handbooks, chapters in specialist monographs and more generally accessibly scientific works. These included: *Mikroskopia elektronowa krwinek* [The electronic microscopy of blood cells] (1955); *Choroby krwi i układu krwiotwórczego* [Blood diseases and the haematopoietic system] (1969); *Hematologia chorób zakaźnych* [The haematology of infectious diseases] (1951, 1975; *The Hematology of infectious diseases*, 1976); *Pożywienie, woda i sól stołowa w ochronie zdrowia społecznego* [Nutrition, water and table salt in the protection of social health] (1978); *Leucemia Ecology* (1982), as well as chapters in *Choroby wewnętrznych* [Internal diseases], edited by E. Szczeklik, in *Choroby układu limfocytów i siateczkowo-śródbłonkowego* [Diseases of the lymphocyte and reticuloendothelial systems] (1968) and in the *Nuclear Hematology – Metabolizm of blood cells* (1975).

One may mention from amongst his more general works for a wider audience: *Biometeorologia w służbie zdrowia* [Biometeorology in the health service] (PAN 147, 1971); *Literatura a zdrowie społeczeństwa* [Literature and the health of society] (PAN 193, 1973); *Rewolucja naukowo-humanistycz-*

na [The scientific-humanistic revolution] (1973); *Nauka o krwi w krakowskich szkołach lekarskich wczoraj, dziś i jutro* [The study of blood in Cracow medical schools yesterday, today and tomorrow] (PAN 296, 1978); *Sumienie ekologiczne* [The ecological conscience] (1979, 1988); *Profesorowie Wydziału Lekarskiego UJ jako uczeni i żołnierze ruchu oporu* [Professors of the Jagiellonian University's Faculty of Medicine as students and soldiers in the resistance] (PAN 348, 1981); *Wiedza stwarza nadzieję* [Knowledge creates hope] (1975); *Nie ma nieuleczalnie chorych* [There are no incurable diseases] (1982); *Kuchnia i medycyna* [Cooking and medicine] (1983/1986); *U progu medycyny jutra* [On the threshold of tomorrow's medicine] (1985/1988); *Studia medyczne a ethos zawodu lekarza* [Medical studies and the ethos of the medical profession] (1985); *Kartki z dziennika Doktora Twardego* [Pages from Doctor Hard's Diary] (1962, 1983).

In 1957 he founded, and for several years was to edit, the only haematological journal of its kind at the time in Poland *Hematologica Cracoviensia*, later renamed *Hematologica Polonica*.

He was the founder and for many years the head of the Commission for the Protection of Social Health at the Polish Academy of Sciences as well as of the Cracow Department of the Polish Society of Psychic Hygiene. He was one of the co-creators of Polish ecological thought as well as being a co-founder of the Polish Ecological Club, the Healthy Man Society, and the Magnesium Society.

He was awarded many orders and prizes, including the Commander's Cross of the Order of *Polonia Restituta*, the awards Meritorious for the Health of the Nation, Meritorious Teacher of the Polish People's Republic, the Father Radzikowski KUL Prize, the prize of the Jurzykowski Foundation in New York. He had many honorary diplomas from Polish and foreign scientific societies including ones from the Polish Medical Society, the Polish Society of Haematologists and Transfusionists, the World Academy of Art and Sciences (New York), the Society of Geochemistry and Health (USA), the American College of Nutrition (USA), the International Society of Haematology, and Societas Haematologica Helvetica.

Professor Aleksandrowicz was a champion of humanitarian values not only in modern medicine but in science and learning as a whole. He was an advocate of an interdisciplinary approach to solving contemporary scientific and social problems. For many he was a model of the daily heroism of work, an example of a scholar whose actions were directed, besides the desire to constantly further intellectual horizons and a passion for research, by an intense sensitivity and goodness of heart. He was a man whose heart and intellect outgrew (and were ahead of) the times in which he lived. The immense effort of Professor Aleksandrowicz's long and fraught life, his achievements, sense of

responsibility for the nation's health and that of the international community at large entered him into that circle of Polish scholars whose names occupy an unquestionable place in the milieu of the entire civilised world.

The professor felt himself to be a Polish patriot, more of Jewish provenance than of religious feeling, for he himself was not religious although for all that not anti-religious. He accepted in his tolerant way the various viewpoints and religions of those he came across. His origins, despite his enormous involvement in social matters and his creative passion, were often the cause of much unpleasantness and attacks from various individuals and groups. He was to encounter antisemitism both during the years of German occupation as in those that followed.

A few months before he died, on the 12th of May 1988, having fought bravely with cancer for many years, he gave a paper – his scientific testament – at the university auditorium to mark the renewal of his Ph.D.

On the 18th of October 1988 he died in Cracow. He was accompanied by throngs of well-wishers to his final resting place at the Rakowicki Cemetery in Cracow, who gave – in accordance with his last wish – instead of flowers donations to the Cracow Branch of the Society for Multiple Sclerosis Patients.

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